MI FluFocus

Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology
Bureau of Laboratories

Michigan Department of Community Health
MDCH
Jennifer M. Granholm, Governor
Janet Olszewski, Director

Editor: Susan Peters, DVM
Surveillance and Infectious Disease Epidemiology
PetersS1@Michigan.gov

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New updates in this issue:

- **Michigan Surveillance:** Influenza continues at low, sporadic levels; RSV activity is increasing.
- **National Surveillance:** Pneumonia and influenza deaths have been above epidemic thresholds.
- **International Surveillance:** Activity has peaked or is starting to decline in most regions of the world.

****2009 Influenza A (H1N1) virus Updates****

Please continue to reference the MDCH influenza website at www.michigan.gov/flu for additional 2009 H1N1 information. Local health departments can find guidance documents in the MI-HAN document library. In addition, additional laboratory-specific information is located at the Bureau of Laboratories H1N1 page at http://www.michigan.gov/mdch/0,1607,7-132-2945_5103-213906--,00.html.

****Influenza Surveillance Reports****

Michigan Disease Surveillance System: During the week ending February 6th, aggregate influenza and individual influenza cases were similar to the previous week's levels, while 2009 novel influenza cases slightly decreased. Case reports are lower than levels seen during this time last year.

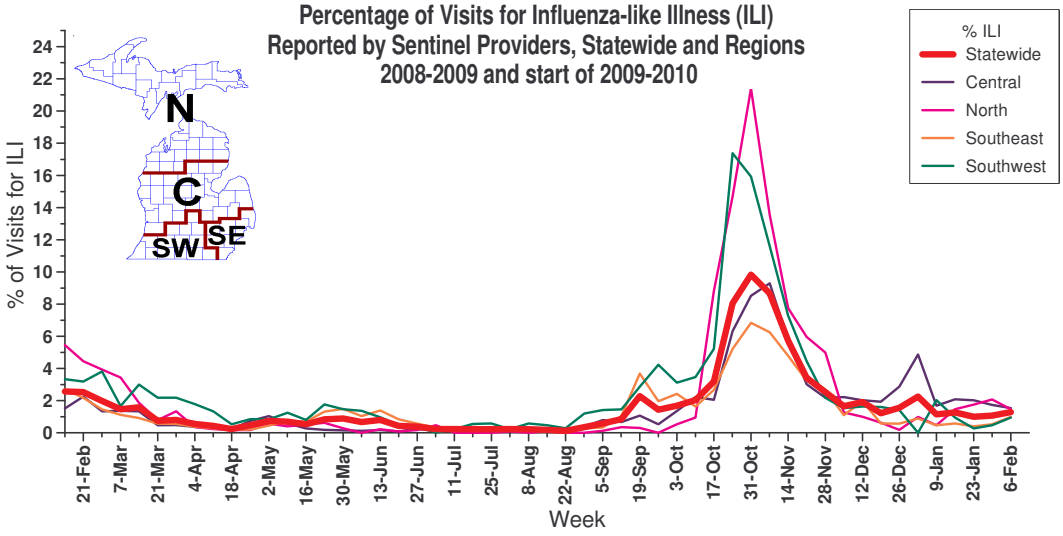
During January 31-February 6, 2010, 9842 cases of flu-like illness and confirmed and probable cases of seasonal and novel influenza were reported in Michigan. 9 hospitalizations and 9 deaths associated with influenza were reported during this time; all 9 deaths were from October to December 2009 and were identified by additional surveillance efforts. This report is updated every Tuesday by 5:00 pm and can be accessed at "Current H1N1 Activity" on this website: http://www.michigan.gov/h1n1flu.

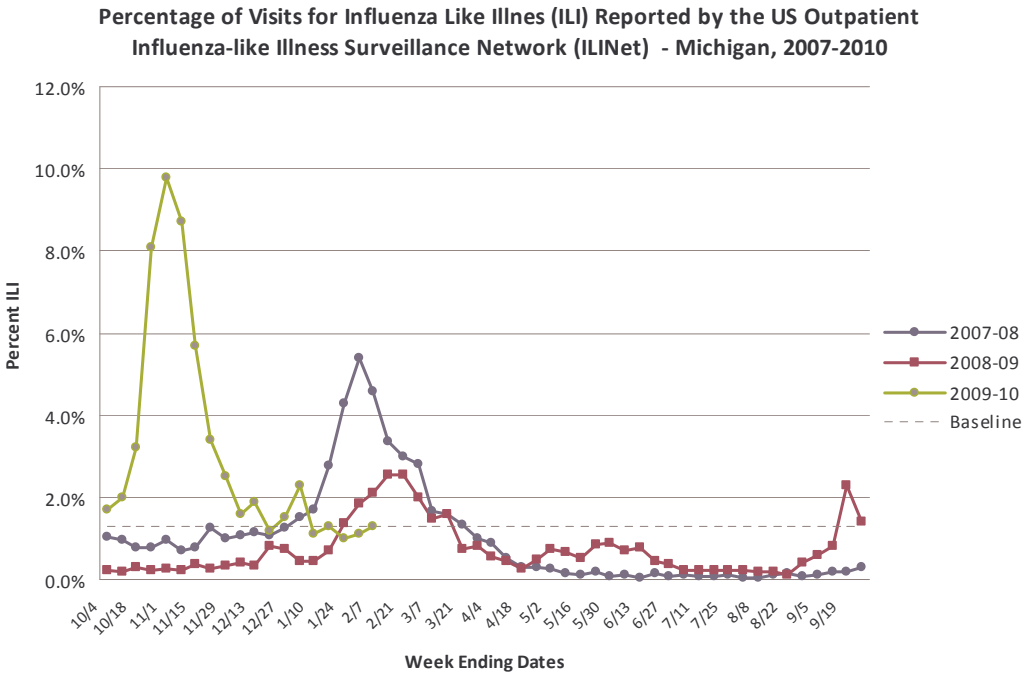
Emergency Department Surveillance: Emergency department visits from constitutional complaints remained steady near the previous week's levels, while respiratory complaints increased slightly. Both constitutional and respiratory complaints are comparable to levels seen at this time last year. In the past week, there were three constitutional alerts in the SW (1), C(1), and N(1) Influenza Surveillance Regions, and two respiratory alerts in the C(2) Influenza Surveillance Region.

Over-the-Counter Product Surveillance: OTC products saw steady sales near the previous week's levels during the past week. Even though their weekly change has been negligible, children's electrolytes sales have been trending upward very slowly over the past month. All indicator sales are consistent with numbers seen this time last year.

Sentinel Provider Surveillance (as of February 11): During the week ending February 6, 2010, the proportion of visits due to influenza-like illness (ILI) slightly increased to 1.3% overall; 88 visits due to ILI were reported out of 6,824 office visits. 25 sentinel sites provided data for this report. Activity increased in two surveillance regions: Southwest (1.0%) and Southeast (1.0%) and decreased in two regions: North (1.5%) and Central (1.5%). Please note that these rates may change as additional reports are received.

As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or CarltonC2@michigan.gov for more information.





Laboratory Surveillance (as of February 6): During January 31-February 6, MDCH Bureau of Laboratories identified three 2009 Influenza A (H1N1) isolates. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 604 influenza isolates:

- 2009 Influenza A (H1N1): 603
- Influenza B: 1

15 sentinel labs reported for the week ending February 6, 2010. 4 labs reported sporadic influenza A activity (SE, C); 11 labs reported no influenza A positives (SE, SW, C, N). 1 lab reported influenza B activity (SE). 10 labs reported low or increasing RSV positives (SE, SW, C, N), 3 labs had moderately elevated RSV positives (SE, SW, C), and 1 lab reported highly elevated numbers of RSV positives (SE)

Michigan Influenza Antigenic Characterization (as of February 11): One novel H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010 Southern Hemisphere vaccine.

Michigan Influenza Antiviral Resistance Data (as of February 11): Results are currently not available for antiviral resistance at CDC for the 2009-2010 season.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at http://www.cdc.gov/H1N1flu/recommendations.htm.

Influenza-Associated Pediatric Mortality (as of February 11): Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

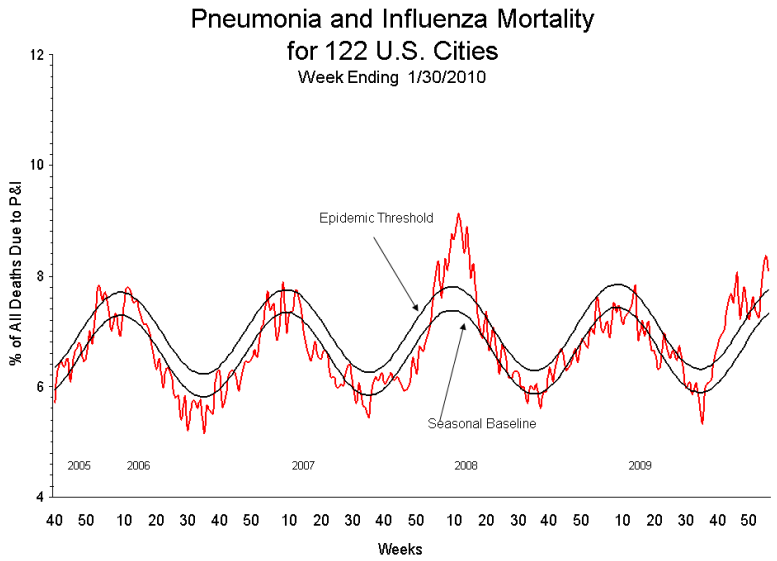
***CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf.

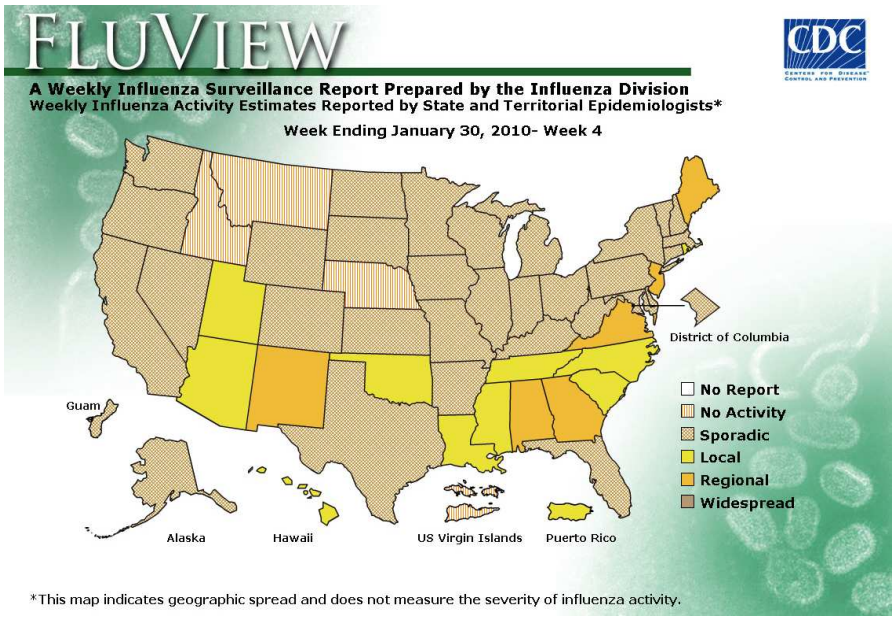
Influenza Congregate Settings Outbreaks (as of February 11): Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and two outbreaks associated with positive influenza A tests (1C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 1 long term care facility.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S – 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

National (CDC [edited], February 5): During week 4 (January 24-30, 2010), influenza activity remained at approximately the same levels as last week in the U.S. 119 (3.2%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. All subtyped influenza A viruses reported to CDC were 2009 influenza A (H1N1) viruses. The proportion of deaths attributed to pneumonia and influenza (P&I) was above the epidemic threshold. Nine influenza-associated pediatric deaths were reported. Eight deaths were associated with 2009 influenza A (H1N1) virus infection and one was associated with an influenza A virus for which the subtype was undetermined. The proportion of outpatient visits for influenza-like illness (ILI) was 1.8% which is below the national baseline of 2.3%. All regions reported ILI below their region-specific baseline. No states reported widespread influenza activity, six states reported regional influenza activity, Puerto Rico and 10 states reported local influenza activity, the District of Columbia, Guam, and 31 states reported sporadic influenza activity, and the U.S. Virgin Islands and three states reported no influenza activity.

CDC has antigenically characterized one seasonal influenza A (H1N1), eight influenza A (H3N2), seven influenza B, and 1,056 2009 influenza A (H1N1) viruses collected since September 1, 2009. One seasonal influenza A (H1N1) virus was tested and is related to the influenza A (H1N1) component of the 2009-10 Northern Hemisphere influenza vaccine (A/Brisbane/59/2007). The eight influenza A (H3N2) viruses tested showed reduced titers with antisera produced against A/Brisbane/10/2007, the 2009-2010 Northern Hemisphere influenza A (H3N2) vaccine component, and were antigenically related to A/Perth/16/2009, the WHO recommended influenza A (H3N2) component of the 2010 Southern Hemisphere vaccine formulation. Influenza B viruses currently circulating globally can be divided into two distinct lineages represented by the B/Yamagata/16/88 and B/Victoria/02/87 viruses. The influenza B component of the 2009-10 vaccine belongs to the B/Victoria lineage. The seven influenza B viruses tested belong to the B/Victoria lineage and are related to the influenza vaccine component for the 2009-10 Northern Hemisphere influenza vaccine (B/Brisbane/60/2008). One thousand fifty-four (99.8%) of 1,056 2009 influenza A (H1N1) viruses tested are related to the A/California/07/2009 (H1N1) reference virus selected by WHO as the 2009 H1N1 vaccine virus. Two viruses (0.3%) tested showed reduced titers with antiserum produced against A/California/07/2009.





To access the entire CDC weekly surveillance report, visit http://www.cdc.gov/flu/weekly/fluactivity.htm

From http://www.cdc.gov/h1n1flu/updates/us/#totalcases:

U.S. Influenza and Pneumonia-Associated Hospitalizations and Deaths from Aug 30, 2009–Jan 30, 2010

Cases Defined by	Hospitalizations	Deaths
Influenza Laboratory-Tests**	39,794	1,905

**States report weekly to CDC either 1) laboratory-confirmed influenza hospitalizations and deaths or 2) pneumonia and influenza syndrome-based cases of hospitalization and death resulting from all types or subtypes of influenza. Although only the laboratory confirmed cases are included in this report, CDC continues to analyze data both from laboratory confirmed and syndromic hospitalizations and deaths.

International (WHO Pandemic Update 86 [edited], February 5): In the temperate zone of the northern hemisphere, overall pandemic influenza activity continues to decline or remain low in most regions since peaking during late October and November 2009. Several areas continue to have evidence of active but declining transmission, particularly in North Africa and in limited areas of Eastern Europe and East Asia.

In North Africa, pandemic influenza transmission remains active and geographically widespread but overall activity has been declining since peaking during late December 2009 and early January 2010. During January 2010, a substantial decline in the number of pandemic virus isolations and new cases was observed in Morocco and Egypt, respectively. In West Asia, pandemic influenza transmission remains geographically widespread to regional, but overall activity remained low.

In South and Southeast Asia, pandemic influenza transmission remains active but geographically localized to regional. The overall intensity of respiratory diseases activity was reported to be low to moderate in most places. In India, influenza activity continued to decline in all regions of the country, however, the most active areas of transmission currently are in the western states. An overall peak in the number of pandemic H1N1 cases was recorded in India during mid December 2009, and the majority of these cases were identified in the northern and western states of India. In Thailand, overall ILI activity remained low, however focal increase in activity were observed in several central and northern provinces.

In East Asia, pandemic influenza transmission remains active and geographically widespread across the region, however, overall activity continued to decline. In Japan, overall influenza activity continues to decline but transmission remains higher on the southern island of Okinawa than in other places. In the Republic of Korea (South Korea), rates of ILI continued to decline to near baseline after a substantial wave of activity which peaked during early to mid November 2009. In Mongolia, after a period of sustained elevated ILI activity since early November 2009, levels of ILI have recently fallen to the expected seasonal range. In northern and southern China, rates of ILI have returned to levels seen during recent seasons; however, approximately 30% of respiratory specimens tested were positive for influenza suggesting that active transmission of influenza viruses persists. Of note in China, in recent weeks the circulation of pandemic influenza H1N1 continued to decline with a concomitant increase in the circulation of seasonal influenza type B viruses (pandemic H1N1 and seasonal Type B viruses accounted for 34% and 66% of all influenza viruses detected, respectively). Active transmission of pandemic influenza virus

also persists in Hong Kong SAR (China), although at significantly lower levels than an earlier peak of activity during September and October 2009.

In Europe, transmission of pandemic influenza virus remains active in a limited number of countries as overall activity remained low in most places. At least seven countries testing more than 20 sentinel respiratory samples reported that >20% of samples had tested positive for influenza (Albania, Bulgaria, the Czech Republic, Georgia, Greece, Luxembourg, and Romania); however, in all seven, rates of illness remained well below earlier peaks of activity. Small increases in ILI/ARI have been reported over the past two reporting weeks in Slovakia, Belarus, and the Russian Federation. The overall rate of sentinel respiratory samples testing positive for influenza fell to 14% after reaching a peak of 45% during early November 2009.

In the Americas, both in the tropical and northern temperate zones, overall pandemic influenza activity continued to decline or remain low in most places. In Central America and Caribbean, pandemic influenza virus transmission persists but overall activity remains low or unchanged in most places.

In temperate regions of the southern hemisphere, sporadic cases of pandemic influenza continued to be reported without evidence of sustained community transmission.

Pandemic influenza (H1N1) 2009 virus continues to be the predominant influenza virus circulating worldwide. In addition to the increasing proportion of seasonal influenza type B viruses recently detected in China, low levels of seasonal H3N2 and type B viruses are circulating in parts of Africa, East and Southeast Asia and are being detected only sporadically on other continents.

MDCH reported **SPORADIC INFLUENZA ACTIVITY** to the CDC for the week ending February 6, 2010.

For those interested in additional influenza vaccination and education information, the MDCH *FluBytes* is available at http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html.

Avian and Novel Influenza Activity

WHO Pandemic Phase: Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

International, Human (WHO [edited], February 8): The Ministry of Health of Egypt has announced two new cases of human H5N1 avian influenza infection.

The first case is a 40-year-old female from Banha District in Daqahliya Governorate. She developed symptoms on 31 January and was hospitalized on 2 February, where she received oseltamivir treatment. She is in stable condition.

The second case is a 29-year-old female from Elsadat District, Menofya Governorate. She developed symptoms on 27 January and was hospitalized on 3 February, where she received oseltamivir treatment. She is in a critical condition.

Investigations into the source of infection indicated that both cases had exposure to sick and dead poultry. The cases were confirmed by the Egyptian Central Public Health Laboratories, a National Influenza Center of the WHO Global Influenza Surveillance Network (GISN). Of the 96 laboratory confirmed cases of avian influenza A(H5N1) reported in Egypt, 27 have been fatal.

International, Human (Taiwan Central News Agency, February 9): While the number of influenza A(H1N1) cases has continued to wane, cases of seasonal influenza B have continued to increase, the Department of Health (DOH) said Tuesday.

Shih Wen-yi, deputy director-general of the DOH's Centers for Disease Control, said the swine flu virus has not been active recently, with only two or three newly hospitalized H1N1 cases.

A 28-year-old pregnant woman was affected with H1N1 recently, but both the mother and child were not in danger, Shih added. He pointed out that DOH-contracted laboratories have found 88 percent of new flu

cases to be H1N1 type, with the remaining 12 percent tested as being B-type.

"This shows a trend of increased cases of influenza B," said Shih.

The trend is especially obvious in China, with influenza B accounting for around 40 percent of flu cases, Shih added.

With the waning of H1N1, which has so far claimed 40 lives in Taiwan, the number of people inoculated has also slipped to between 1,000 and 2,000 daily, he said.

International, Human (WHO, February 10): The Ministry of Health of Egypt has announced a new case of human H5N1 avian influenza infection. The case is a 37-year-old male from Helwan District, Helwan Governorate. He developed symptoms on 31 January and was hospitalized on 6 February, where he received oseltamivir treatment. He is in a critical condition. The case was confirmed by the Egyptian Central Public Health Laboratories, a National Influenza Center of the WHO Global Influenza Surveillance Network (GISN). Of the 97 laboratory confirmed cases of avian influenza A(H5N1) reported in Egypt, 27 have been fatal.

International, Avian (OIE [edited], February 5): High path avian influenza H5N1; Country: Myanmar
Date of first confirmation of the event: 03/02/2010; Date of Start of Event: 02/02/2010
Date of report: 05/02/2010; Date Submitted To OIE: 05/02/2010
Province: YANGON; District: Yangon (west); Sub-district: Mayangone; Location: Ward No. 5
Species: Birds; Susceptible: 2455; Cases: 100; Deaths: 100; Destroyed: 2355; Slaughtered: 0
Affected Population 50-week-old layer chickens

Epidemiological comments: The farmer purchased the pullet chickens. The production system is battery cages. There are two buildings and each building has chickens. 100 out of 2,455 chickens died from 1 February 2010.
Source of the outbreak(s) or origin of infection: Unknown or inconclusive
Control Measures Applied: Stamping out, Quarantine, Movement control inside the country, Screening, Disinfection of infected premises/establishment(s)
To be applied: No Planned Control Measures; Animals treated: No; Vaccination Prohibited: Yes

International, Avian (OIE [edited], February 5): High path avian influenza H5N1; Country: Nepal
Date of first confirmation of the event: 31/01/2010; Date of Start of Event: 26/01/2010
Date of report: 05/02/2010; Date Submitted To OIE: 05/02/2010
Zone: GANDAKI; District: Kaski; Village: Gharipatan; Location: Pokhara submetropolitan city, ward No. 7
Species: Birds; Susceptible: -; Cases: 153; Deaths: 153; Destroyed: -; Slaughtered: -
Affected Population: Backyard ducks and chickens and few commercial farms.

Epidemiological comments: Stamping out operation is in progress.
Source of the outbreak(s) or origin of infection: Unknown or inconclusive
Control Measures Applied: Quarantine, Movement control inside the country, Disinfection of infected premises/establishment(s), Dipping / Spraying
To be applied: Stamping out; Vaccination Prohibited: Yes; Animals treated: No

International, Avian (OIE [edited], February 5): High path avian influenza H5N1; Country: Cambodia
Date of first confirmation of the event: 29/01/2010; Date of Start of Event: 27/01/2010
Date of report: 05/02/2010; Date Submitted To OIE: 05/02/2010
Province: TAKEO; District: Koah Andaet; Sub-district: Ro Minh; Location: Pralay Meas
Species: Birds; Susceptible: -; Cases: 31070; Deaths: 16442; Destroyed: -; Slaughtered: -

Epidemiological comments: An investigation is ongoing on site since 2 February 2010. Further information will be provided later in the follow-up reports.
Source of the outbreak(s) or origin of infection: Unknown or inconclusive
Control Measures Applied: Movement control inside the country, Disinfection of infected premises/establishment(s), Modified stamping out
To be applied: No Planned Control Measures; Animals treated: No

International, Avian (The Voice of Vietnam News [edited], February 9): Bird flu is now spreading rapidly in many provinces after a long period of containment, the Department of Animal Health (DAH) said on Mon 8 Feb 2010.

The provinces of Ca Mau, Ha Tinh, Dien Bien, Soc Trang, Kon Tum, and Quang Tri have all reported cases of bird flu infection in the last 21 days. Quang Tri is the latest province to confirm a bird flu outbreak in Trieu Phong district. It has culled 400 birds in a farm and is carrying out measures to prevent any further spread of the disease.

The DAH asked these provinces to step up their preventive measures and vaccination campaigns, during the Tet holiday when demand for poultry products increasing. The Minister of Agriculture and Rural Development, Cao Duc Phat, has urged provinces and cities to oversee the slaughtering of cattle and poultry in certain places and ban the sales of cattle and poultry products of unknown origins.

In addition, the Ministries of Health, Industry and Trade, Transport and Public Security will increase food hygiene and safety inspections, conduct fact-finding tours of localities, especially big cities, and strictly control transport of animals and animal products.

International, Antibodies (Eurosurveillance edition 2010; 15(5), February 4): High frequency of cross-reacting antibodies against 2009 pandemic influenza A (H1N1) virus among the elderly in Finland (abstract)

Since May 2009, the pandemic influenza A (H1N1) virus has been spreading throughout the world. Epidemiological data indicate that the elderly are underrepresented among the ill individuals. Approximately 1000 serum specimens collected in Finland in 2004 and 2005 from individuals born between 1909 and 2005, were analysed by haemagglutination-inhibition test for the presence of antibodies against the 2009 pandemic influenza A(H1N1) and recently circulating seasonal influenza A viruses. 96 per cent of individuals born between 1909 and 1919 had antibodies against the 2009 pandemic influenza virus, while in age groups born between 1920 and 1944, the prevalence varied from 77 per cent to 14 per cent. Most individuals born after 1944 lacked antibodies to the pandemic virus. In sequence comparisons the haemagglutinin (HA) gene of the 2009 pandemic influenza A (H1N1) virus was closely related to that of the Spanish influenza and 1976 swine influenza viruses. Based on the 3-dimensional structure of the HA molecule, the antigenic epitopes of the pandemic virus HA are more closely related to those of the Spanish influenza HA than to those of recent seasonal influenza A (H1N1) viruses. Among the elderly, cross-reactive antibodies against the 2009 pandemic influenza virus, which likely originate from infections caused by the Spanish influenza virus and its immediate descendants, may provide protective immunity against the present pandemic virus.

The entire article can be viewed at http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19478.

International, Antiviral Resistance (WHO Weekly Epidemiological Record No. 6, 2010, 85, 37–48 [edited], February 5): Update on oseltamivir-resistant pandemic A (H1N1) 2009 influenza virus: January 2010. The entire article is available online at http://www.who.int/wer/2010/wer8506/en/index.html.

Since the first report of oseltamivir-resistant pandemic influenza A (H1N1) 2009 virus in June 2009, >200 cases of resistant virus have been reported worldwide. The purpose of this article is to provide a brief global update on cases of oseltamivir-resistant pandemic (H1N1) 2009 viruses since the first report published in the *Weekly Epidemiological Record* in October 2009.

Description of cases of oseltamivir resistance: As of 3 February 2010, a total of 225 oseltamivir-resistant cases had been reported and confirmed worldwide. All these oseltamivir-resistant isolates have the same mutation in the neuraminidase gene (H275Y), conferring resistance to oseltamivir but not to zanamivir. There is also no evidence of reassortment between pandemic (H1N1) 2009 and other seasonal influenza A (H1N1) viruses, which have shown a high prevalence of oseltamivir resistance.

Of the 142 cases of oseltamivir-resistant pandemic influenza virus for which data are available, 56 (40%) have been identified in severely immunocompromised patients, 54 (38%) were associated with the treatment of influenza, 16 (11%) with chemoprophylaxis, and 16 (11%) had no known association with antiviral drug use, including 7 cases occurring as part of a cluster in Viet Nam (described below).

Oseltamivir-resistant viruses have been reported in 20 countries across 4 WHO regions; antiviral susceptibility testing has occurred on >20 000 pandemic (H1N1) 2009 specimens isolated from >86 countries. With the exception of the 3 clusters described below, there are few epidemiological links among any of the reported cases. The majority of these cases are sporadic, isolated cases, and there is no evidence yet that oseltamivir-resistant pandemic (H1N1) 2009 viruses are circulating in the community.

Clusters of oseltamivir-resistant viruses in severely immunocompromised patients: Of the 56 cases of oseltamivir-resistant viruses isolated from severely immunocompromised patients, 12 are related to 2 clusters within hospital wards. The first cluster of 4 oseltamivir-resistant pandemic (H1N1) 2009 viruses emerged at Duke University Hospital in Durham, North Carolina, United States. One male and 3 female patients, ranging in age from 43 years to 67 years, with severely immunocompromised status, were admitted to the same ward. The onset of influenza illness occurred in a 2-week period between mid-October and early November. While 3 of the cases were fatal, the role of H1N1 infection in contributing to the deaths is uncertain. In 3 of the 4 cases, the H275Y mutation was identified before oseltamivir was administered.

The second known cluster included 8 patients with underlying haematological malignancies at the University Hospital of Wales in Cardiff, Wales, United Kingdom, in November 2009. Resistant viruses appeared to have been treatment-induced in 2 cases. At least 4 patients contracted the resistant virus through person-to-person transmission. Two of 8 patients in this cluster had had an interrupted course of oseltamivir treatment before and after the recognition of oseltamivir resistance. None of these cases were fatal.

The observation that severely immunocompromised patients are at a higher risk of developing oseltamivir-resistant virus during treatment has already been highlighted. Following these 2 clusters of cases, WHO issued a briefing note reiterating the importance of monitoring for antiviral resistance in severely immunocompromised patients undergoing antiviral treatment.

Person-to-person transmission of oseltamivir-resistant viruses in healthy adults: In July 2009, a cluster of previously unreported cases of oseltamivir-resistant pandemic (H1N1) 2009 influenza virus infection was identified in 7 healthy young adults traveling on a train from Ho Chi Minh City to Hanoi in Viet Nam. All 7 were shown to have the H275Y mutation in samples taken prior to oseltamivir treatment. The authors concluded that these cases were the result of person-to-person transmission from an unidentified index case. No additional cases have been identified from this cluster subsequently.

It is also possible that very limited person-to-person transmission occurred in some of the other 9 cases of the 16 where oseltamivir resistance arose in patients who were not taking the antiviral.

Conclusions: The number of reported cases of oseltamivir-resistant pandemic (H1N1) 2009 influenza virus remains low despite the large scale of the pandemic, widespread use of oseltamivir and extensive monitoring of susceptibility. Although there is no evidence of general community circulation of such resistant viruses, there is clear evidence of limited person-to-person transmission in several epidemiological settings. Active surveillance for antiviral resistance in pandemic (H1N1) 2009 virus needs to be maintained by clinicians, laboratories and agencies. All cases of oseltamivir-resistant pandemic A (H1N1) 2009 influenza virus should be investigated and promptly notified to relevant agencies including WHO.

Michigan Wild Bird Surveillance (USDA, as of February 11): For the 2009 testing season (April 1, 2009-March 31, 2010), HPAI subtype H5N1 has not been recovered from any of the 111 Michigan samples tested to date, including 58 live wild birds, 39 hunter-killed birds and 14 morbidity/mortality specimens. H5N1 HPAI has not been recovered from 18,033 samples tested nationwide. For more information, visit the National HPAI Early Detection Data System at http://wildlifedisease.nbii.gov/ai/.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at http://www.michigan.gov/emergingdiseases.

Please contact Susan Peters at PetersS1@Michigan.gov with any questions regarding this newsletter or to be added to the weekly electronic mailing list.

Contributors

MDCH Bureau of Epidemiology - Sally Bidol, MPH; Cristi Carlton, MPH; Jamey Hardesty, MPH

MDCH Bureau of Laboratories – Anthony Muyombwe, PhD; Victoria Vavricka, MS

Table 1. H5N1 Influenza in Poultry (Outbreaks up to February 5, 2010)

(Source: http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 2/8/10)

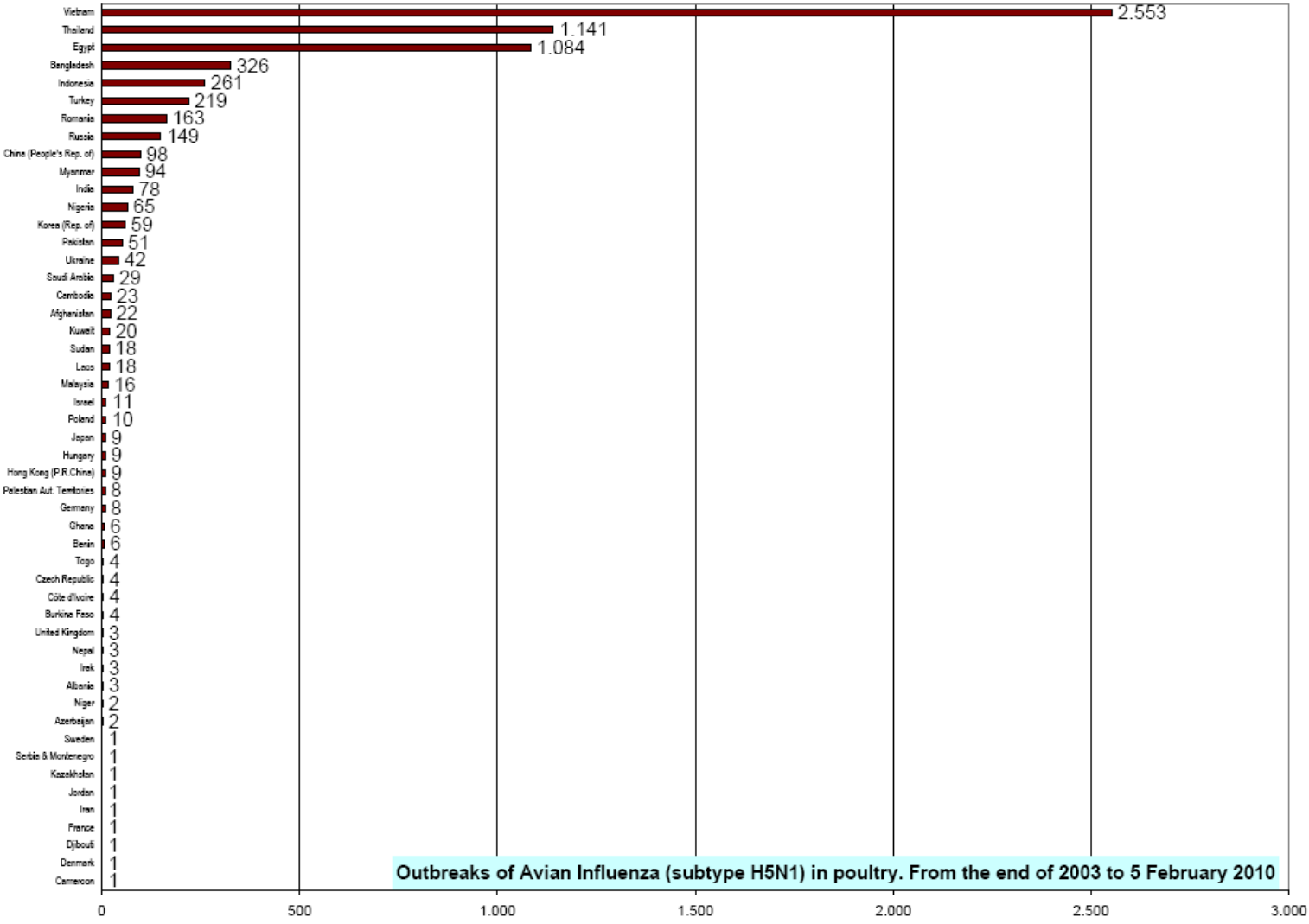


Table 2. H5N1 Influenza in Humans (Cases up to February 10, 2010)

(http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_02_10/en/index.html Downloaded 2/10/2010)

Cumulative number of lab-confirmed human cases reported to WHO. Total number of cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	0	0	9	7
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	0	0	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	7	0	97	27
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	20	19	0	0	161	134
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	0	0	112	57
Total	4	4	46	32	98	43	115	79	88	59	44	33	72	32	7	0	474	282